國立臺北科技大學112學年度碩士班招生考試

系所組別：1201 製造科技研究所

第一節　微分方程　試題（選考）

注意事項：

1. 本試題共 5 題，每題 15-25 分，共 100 分。
2. 不必抄題，作答時請將試題題號及答案依照順序寫在答案卷上。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

1. Solve the following initial value differential equation: (15pts)

$y''+0.4y'+9.04y=0,\quad y(0)=0,\ y'(0)=3$

2. Solve the following initial value differential equation: (25pts)

(1) $x^2y'+3xy-x+1=0$ with $y(2)=0$ (10pts)

(2) $y''+4y=2\cos 3x+3\sin 3x$ with $y(0)=3$ and $y'(0)=2$ (15pts)

3. Please solve the following differential equation: (15pts)

$4x^2y'''+12xy''+3y'=0,\ y(1)=0,\ y'(1)=1.5,\ y''(1)=-1.75$

4. Please solve the following differential equation (20pts)

(1) $xy'+y-e^x=0,\ y(1)=e$ (10pts)

(2) $x^2y'+2xy-x+1=0,$ with $y(1)=0.$ (10pts)

5. Pleas solve the following ODE: (25pts)

(1) $x(x-1)y''+(3x-1)y'+y=0$ (15 points)

(2) $\dfrac{d^2y}{dx^2}-4x\dfrac{dy}{dx}+4x^2y=xe^{x^2}$ (10 points)